WHAT IS CLAIMED IS:

1. A method of forming a trench in a semiconductor device, comprising:

(a) a step of depositing a first pad film and a second pad film on a semiconductor substrate;

(b) a step of pattering the first pad film and the second pad film to expose the semiconductor substrate;

(c) a step of performing an ion implanting process to the exposed semiconductor substrate to cause lattice defects in an area of the semiconductor substrate into which the ions are implanted through the ion implanting process; and

(d) a step of performing an etching process using a trench etching mask, wherein the area of the semiconductor substrate in which the lattice defects are caused in the step of (c) is etched more rapidly than an area in which the lattice defects are not caused, thereby forming the trench.

2. A method of forming a trench in a semiconductor device according to claim 1, wherein the ion implanting process uses an inert gas in the periodic table.

3. A method of forming a trench in a semiconductor device according to claim 2, wherein the inert gas is any one of He, Ne, Ar, Kr, and Xe.

4. A method of forming a trench in a semiconductor device, comprising:

(a) a step of depositing a first pad film and a second pad film on a semiconductor substrate;

(b) a step of patterning the first pad film and the second pad film;

(c) a step of forming spacers on inner side walls of the patterned first and second pad films;

(d) a step of performing a first ion implanting process to the semiconductor substrate exposed between the spacers;

(e) a step of performing an etching process to decrease thicknesses of the spacers, thereby increasing a line-width of a trench to be formed in subsequent processes;

(f) a step of performing a second ion implanting process to the semiconductor substrate; and

(g) a step of etching an area of the semiconductor substrate in which lattice defects are caused through the first and second ion implanting processes, thereby forming the trench.

5. A method of forming a trench in a semiconductor device according to claim 4, wherein the first and second ion implanting processes use an inert gas in the periodic table.

6. A method of forming a trench in a semiconductor device according to claim 5, wherein the inert gas is any one of He, Ne, Ar, Kr, and Xe.

7. A method of forming a trench in a semiconductor device according to claim 4, wherein the first ion implanting process is performed with an ion

dose in the range of 1.0×10^{10} ions/cm^2 to 1.0×10^{18} ions/cm^2 and an ion implanting energy in the range of 3KeV to 60KeV.

8. A method of forming a trench in a semiconductor device according to claim 4, wherein the ions implanted through the first ion implanting process in the step of (d) are distributed in the semiconductor substrate with a range of about 1000 Å to 4000 Å.

9. A method of forming a trench in a semiconductor device according to claim 4, wherein the second ion implanting process is performed with an ion dose in the range of 1.0×10^{10} ions/cm^2 to 1.0×10^{18} ions/cm^2 and an ion implanting energy in the range of 3KeV to 55KeV.

10. A method of forming a trench in a semiconductor device according to claim 4, wherein the ions implanted through the second ion implanting process in the step of (f) are distributed in the semiconductor substrate with a range of about 300 Å to 3000 Å.

11. A method of forming a trench in a semiconductor device according to claim 4, wherein, in the step of (a), further comprising a step of depositing an oxide film on the second pad film.